

WHAT IS CLAIMED IS:

1. A driving arrangement for an active matrix liquid crystal display comprising:

5 (a) a multi-format digital data driver arranged to operate in a plurality of different display modes, to receive digital input data in a plurality of different formats, and to drive data lines of the liquid crystal display so as to cause an image to be displayed by the display corresponding to said input data; and

10 (b) data analysis means arranged to receive said digital input data, to determine the format of the input data, and to control the data driver to operate in the display mode corresponding to the format of the input data.

2. A driving arrangement as claimed in claim 1, wherein the data analysis means forms part of the data driver.

20 3. A driving arrangement as claimed in claim 1, wherein the data driver is arranged to consume less power in low resolution display modes compared to high resolution display modes.

4. A driving arrangement as claimed in claim 1, wherein said display modes include at least one 1-bit overlay mode.

5 5. A driving arrangement as claimed in claim 1, wherein
the data analysis means analyses each frame of input data
in turn, and updates the mode of the data driver at the
end of each frame.

10 6. A driving arrangement as claimed in claim 1, wherein the data analysis means comprises frame comparison means for comparing each frame of input data with the next, and for determining if the input data for a number of consecutive frames is the same.

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7. A driving arrangement as claimed in claim 6, wherein the data driver is arranged to operate at more than one refresh rate, and wherein the data analysis means is arranged to control the data driver to operate at a lower refresh rate if the comparison means determines that the

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input data has remained unchanged for a number of frames.

8. A driving arrangement as claimed in claim 1, wherein the data analysis means comprises a plurality of inputs

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13. A driving arrangement as claimed in claim 1, wherein

the data analysis means comprises a number of storage registers.

14. An active matrix liquid crystal display comprising
5 a driving arrangement as claimed in claim 1.

15. An active matrix liquid crystal display as claimed
in claim 14, wherein the driving arrangement is integrated
monolithically onto the same substrate as the thin film
10 transistors of the active matrix.

16. An active matrix liquid crystal display as claimed
in claim 15, wherein said thin film transistors are
poly-silicon
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17. A method of reducing the power required to display
a sequence of images on a liquid crystal display,
comprising the steps of:

20 analysing the image data representing each image,
comparing the image data for the current image with
that for the previous image,

from the comparison of the previous step, determining
whether the two images are the same, or substantially the
same,

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22. A method as claimed in claim 21, wherein said signature is produced using a linear feedback shift register.

23. A method as claimed in claim 19, wherein at least some of the bits representing the brightness level of each pixel are ignored when producing said signature.

5 24. A method as claimed in claim 23, wherein the bit or bits which are ignored are the least significant bit or bits.

10 25. A method as claimed in claim 17, wherein said sequence of digital images occupy only a part of said liquid crystal display.

15 26. A method as claimed in claim 25, wherein said liquid crystal display is divided into a plurality of regions, and the steps of the method are carried out separately for each region, so that if the current and previous images for a given region are determined to be the same, or substantially the same, then that region is not updated with at least the subsequent image, or portion of an image,
20 for that region.

27. A method as claimed in claim 17, wherein if it is determined that the liquid crystal display, or a portion thereof, is not to be updated, a first control signal is

5 28. A method as claimed in claim 17, wherein if it is
determined that the liquid crystal display, or a portion
thereof, is not to be updated, a second control signal
is sent to a frame store associated with the liquid crystal
display, said second control signal preventing image data
10 from being written out of said frame store.

29. A method as claimed in claim 17, wherein in the step of determining whether said two images are the same, or substantially the same, said two images are considered to be substantially the same if the current image represents a translation, or substantially a translation, of the previous image.

30. A method as claimed in claim 29, wherein said step
20 of analysing the image data includes:

producing a first sub-signature for a first region
of a first image, and

producing a second sub-signature for a second region of the first image, wherein said first region of the first

[illegible]

image corresponds to a translation of said second region of the first image by one or more pixels, and

producing a first sub-signature for a first region of the subsequent image, and

5 producing a second sub-signature for a second region of the subsequent image, wherein said first region of the subsequent image corresponds to a translation of said second region of the subsequent image by one or more pixels, and

10 comparing said first and second sub-signatures for the first image with said first and second sub-signatures for the subsequent image, to determine whether the subsequent image represents a translation, or substantially a translation, or the first image.

15 31. A method as claimed in claim 30, wherein each sub-signature is produced using a linear feedback shift register.

20 32. A method as claimed in claim 30, wherein at least 8 sub-signatures are produced for each of said first and subsequent images, said sub-signatures corresponding to translations in different directions.

33. A method as claimed in claim 30, wherein said first and second regions of the first and subsequent images do not include any pixels which lie adjacent an edge of the images.

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34. A method as claimed in claim 17, wherein said liquid crystal display is DC balanced, and wherein if the liquid crystal display is not updated, the polarity applied to pixels in subsequent frames is such that DC balance is retained over time.

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35. A method as claimed in claim 34, wherein if the liquid crystal display is not updated for one or more frames, then the polarity, or polarities, applied to pixels on the first subsequent frame which is updated is or are the same as the polarity or polarities existing during said one or more frames.

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36. Data analysis means arranged to carry out the method of claim 17.

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37. Data analysis means as claimed in claim 36, which comprises a linear feedback shift register.

38. Data analysis means as claimed in claim 36, which further comprises a first control output arranged to provide a first control signal to a data driver, wherein if it is determined that the liquid crystal display, or a portion thereof, is not to be updated, said first control signal is sent to said data driver associated with the liquid crystal display, said first control signal preventing the liquid crystal display, or a portion thereof, from being updated.

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39. Data analysis means as claimed in claim 36, which further comprises a second control output arranged to provide a second control signal to a frame store, wherein if it is determined that the liquid crystal display, or a portion thereof, is not to be updated, said second control signal is sent to said frame store associated with the liquid crystal display, said second control signal preventing image data from being written out of said frame store.

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40. A liquid crystal display device comprising a liquid crystal display, a data driver, and a data analysis means as claimed in claim 36.